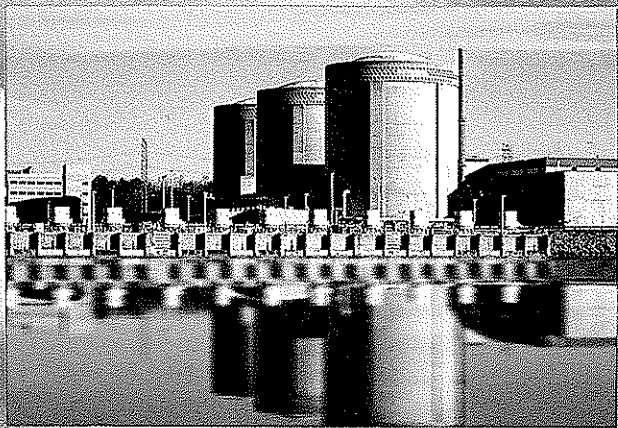
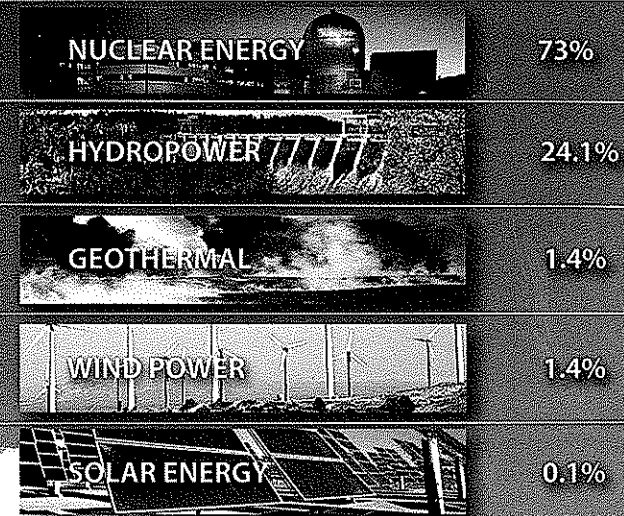


Nuclear Energy: Powering America's Future



Nuclear Energy Is America's Largest Source of Emission-Free Electricity

April 2009



Expanding non-emitting electricity sources to meet our growing electricity needs is an enormous challenge. Assuming dramatic increases in wind and solar power, the United States would have to build 25 to 30 new nuclear power plants by 2030 simply to maintain nuclear energy's present share of non-emitting electricity capacity.

Energy for the Future

Supplying electricity to grow our economy and protecting our air quality are important national goals. With new nuclear power plants, America can do both. The energy industry is planning to build advanced nuclear plants to meet growing electricity demand while enhancing U.S. energy independence and reducing greenhouse gases.

The U.S. Department of Energy projects that electricity demand will rise 21 percent by 2030. Even with conservation and efficiency measures, we will need hundreds of new power plants from a diverse portfolio of fuel sources to supply electricity for a high standard of living and to promote domestic economic growth.

The 104 U.S. nuclear reactors operating in 31 states produce about 20 percent of the nation's electricity. Nuclear energy produces more electricity than any other source in New York, New Jersey, South Carolina and Vermont.



Among clean-air electricity sources, nuclear energy plays an even greater role. Only 26 percent of our nation's overall electricity comes from carbon-free sources, and nuclear power plants generate almost three-fourths of it. Nuclear energy also has the best efficiency rating and one of the lowest costs for producing electricity.

America must increase electricity output from nuclear energy to help power economic growth with the least impact on our environment, the least reliance on foreign nations and the least cost to American consumers.



Nuclear Plants: Safe, Clean Energy

American nuclear power plants are regulated by the U.S. Nuclear Regulatory Commission and operate at peak levels of safety and reliability. The NRC has independent inspectors at each reactor, and the agency's reactor oversight process shows consistently high safety performance across the industry.

The nuclear energy industry's operations include multiple levels of safety. Nuclear plants are massive structures with steel-reinforced concrete walls and layers of backup safety systems. They also have NRC-licensed operators, who spend every sixth week in a continuous training regime. This rigorous training includes sessions in full-scale reactor control room simulators responding to various reactor operating scenarios, with the aim of improving safe operations.

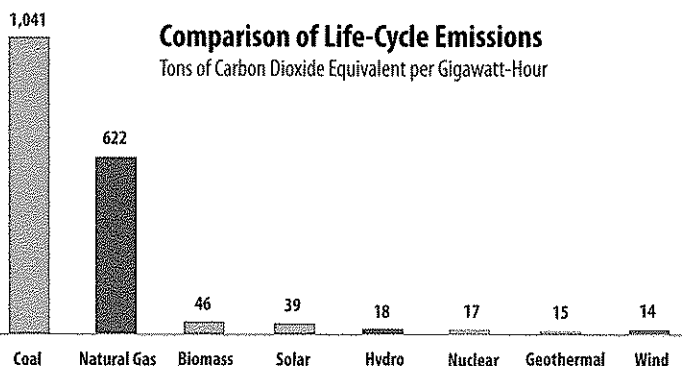
In addition, the industry has the most sophisticated security and emergency preparedness plans in the U.S. industrial sector. All these features protect the safety of workers and plant neighbors.

Nuclear plants play a vital role in protecting our nation's air quality and addressing global climate change. Without nuclear power plants, levels of harmful emissions released into the atmosphere would increase significantly—particularly those that contribute to acid rain (sulfur dioxide) and urban smog (nitrogen dioxide).

Nuclear power plants do not produce any greenhouse gases during the electricity production process and have among the lowest total "life-cycle" carbon emissions. This reflects all plant-related activities, from uranium mining to construction and decommissioning of the plant.

The life-cycle carbon footprint of a nuclear power plant is comparable to wind and hydropower plants, yet nuclear is a 24/7, large-scale power producer.

Nuclear energy helps protect the environment for future generations. At far right: Highly trained, federally licensed operators ensure safe nuclear plant operation.



Nuclear energy's life-cycle emissions of carbon dioxide are equivalent to those of wind and hydropower—and significantly less than those of solar energy and other electricity sources.

Source: "Life-Cycle Assessment of Electricity Generation Systems and Applications for Climate Change Policy Analysis," Paul J. Meier, University of Wisconsin-Madison, August 2002.

Construction of Advanced Nuclear Power Plants

A new generation of nuclear power plants will feature advanced designs, refined construction techniques, and a licensing process geared to a mature technology—improvements built on 50 years of experience in operating nuclear plants.

Most U.S. reactors were licensed and built between 1965 and 1985, when commercial nuclear energy and the regulations governing it were new and evolving rapidly.

A new licensing process, established in 1992, moved the resolution of safety issues to the front of three approval processes for new reactors: siting, design and construction/operation.

NRC regulations provide for:

- approval of a site in advance of a decision to build a reactor
- approval of advanced nuclear power plant designs
- combined construction/operating license ("combined license") that allows a company to operate a completed plant provided it conforms to the approved design.

The new approach makes licensing a nuclear plant more efficient and more transparent to the public. Throughout the licensing process, the public has numerous opportunities to comment before major construction begins.

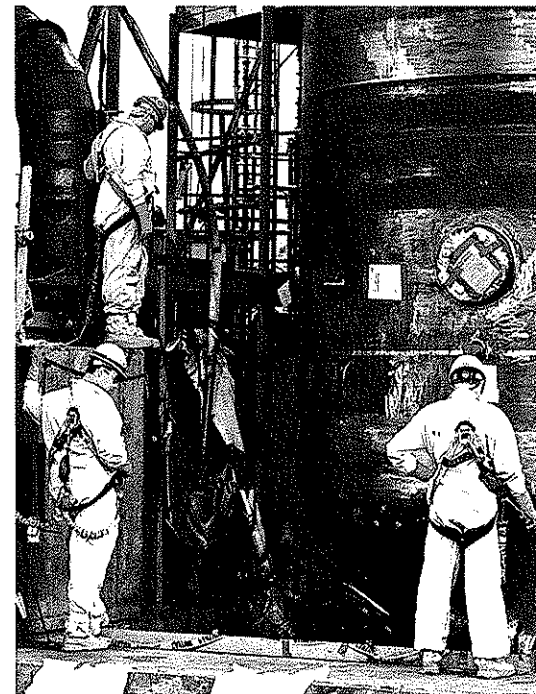
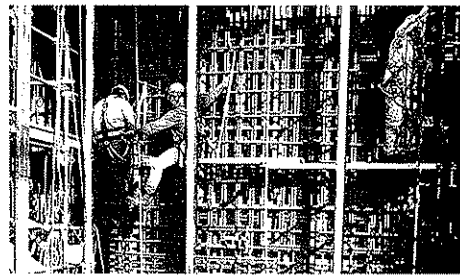
Companies started applying to the NRC for combined licenses in 2007—for the first time in nearly 30 years.

Although the U.S. nuclear industry has not built a new plant in some years, it has never stopped working on large capital projects that are an

ongoing part of maintaining and refurbishing the 104 existing reactors. For example, the industry has made major upgrades at many plants to boost the amount of electricity they produce.

Also, Tennessee Valley Authority refurbished the Browns Ferry 1 reactor in a five-year, \$1.9 billion project, on schedule and within budget. The reactor had been shut down since 1985, but was restarted in 2007 and provides electricity to serve 800,000 homes.

The industry that is building the next generation of nuclear plants is far different from the one that built the currently operating reactors: It has 50 years' experience in building, operating and maintaining the world's largest nuclear energy program and a sustained record of world-class plant performance.



The U.S. nuclear industry has substantial recent experience in large capital projects, which are part of the ongoing maintenance and refurbishment of existing plants. The development of new nuclear plants is spurring the creation of thousands of high-paying jobs in manufacturing, construction, engineering, skilled crafts and many other areas.

These are careers, not just jobs. They enable workers to buy homes, send their children to college, live decent lives and retire with dignity."

—Steve Kelly
Assistant General President
United Association of Plumbers and Pipefitters

New nuclear plants create opportunities for expanding U.S. manufacturing. A single new plant requires about 66,000 tons of steel, 400,000 cubic yards of concrete, 44 miles of pipe, 300 miles of electric wiring and 130,000 electrical components.

Nuclear Plants Boost State and Local Economies

Nuclear plants contribute substantially to state and local economies, both in direct spending and in economic activity generated by the presence of the plant and its employees. Each new reactor will create between 1,400 and 1,800 jobs for construction, with peak employment of up to 2,400 workers. Once in operation, the average nuclear plant:

- employs 400 to 700 people in the local community at salaries typically substantially higher than the local average
- generates approximately \$430 million in sales of goods and services in the local community and nearly \$40 million in total labor income
- provides annual state and local tax revenue of more than \$20 million, benefiting schools, roads and other state and local infrastructure.

Many communities and states are actively supporting new nuclear plant projects, recognizing their value as safe, clean and economically beneficial industrial neighbors.

New nuclear projects are in the early stages of development, and the start of major construction is three to five years away. The prospect of new construction already has stimulated significant investment and job creation among companies that supply equipment and services to the nuclear industry.

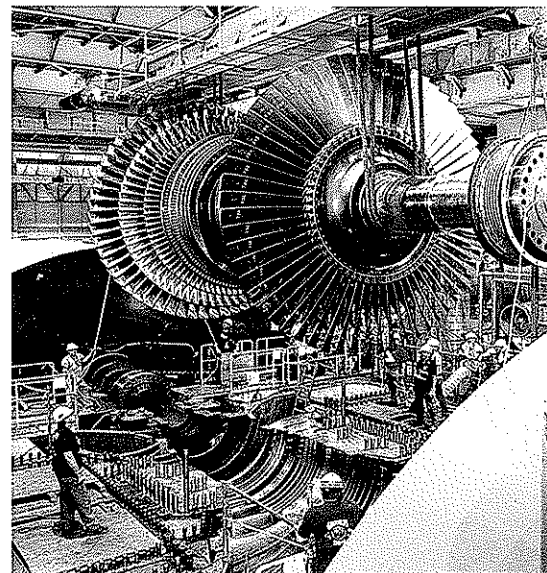
Over the past three years, the industry has invested more than \$4 billion in new nuclear plants and created 15,000 jobs—with an additional \$8 billion investment to follow in the next few years.

When it comes to providing good-paying jobs for American workers, [nuclear energy is] one of our economy's leading sectors."

—Rep. Steny Hoyer (D-Md.)



Southern Company has started preliminary site preparation for two reactors at its Vogle nuclear plant in Georgia. Preparing a site while a license application is under review can help bring a new plant online up to 18 months earlier.



Many plant owners have invested in major upgrades to turbines and other components to increase the amount of electricity the plants can generate. To meet future increases in electricity demand, power companies must build new plants now.

Creating the Investment Climate for New Reactors

Electricity is integral to modern life, providing energy to operate home appliances, factories and life-saving medical equipment. However, ensuring a reliable, affordable supply of electricity to meet increasing demand over the next two decades will require an enormous investment in our nation's energy infrastructure.

The electric power sector must invest between \$1.5 trillion and \$2 trillion in new power plants, transmission and distribution systems, and environmental controls. The industry faces a significant challenge in financing this investment.



Appliances account for 65 percent of the electricity consumed by the average U.S. household.

U.S. government policies and practices support the development of nuclear power plants and other clean energy technologies through limited financial incentives made available by the Energy Policy Act of 2005. The law sustains a long-standing government tradition of providing limited financial backing for energy projects vital to the nation's infrastructure.

Transforming the U.S. electric power sector is both a daunting challenge and a tremendous opportunity. If America rises to the challenge, we will create a 21st century electricity system, produce millions of green jobs, rebuild our manufacturing base and generate economic growth and opportunity.

There is bipartisan recognition in Congress that the United States needs new nuclear plants to meet increasing electricity demand while curbing emissions of greenhouse gases.



Nuclear energy is the only large-scale source of constantly available electricity that can be expanded significantly with such a small environmental footprint. A single 1,000-megawatt nuclear plant can generate enough electricity for a city the size of Boston.

A large portion of the jobs that would be supported by the nuclear investment program ... are high-tech, value-added jobs. ... Benefits of the investment program are not confined to states which are expected to increase nuclear capacity."

—"Economic Benefits of Nuclear Energy in the USA," Oxford Economics, May 2008.

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Safely Used Nuclear Fuel

A necessary byproduct of nuclear power plant operations is used uranium fuel. This is a solid ceramic material that is safely contained inside metal tubes to form what are called "fuel assemblies." If you stacked all of the used nuclear fuel that has been produced from U.S. nuclear power plants over the past 50 years, it would cover only a single football field as high as the goal post.

Used fuel at nuclear power plant sites is managed securely in special buildings that house the fuel in steel-lined, concrete pools filled with water. After the used fuel cools, it can be stored on plant property in robust steel or steel-lined concrete containers.

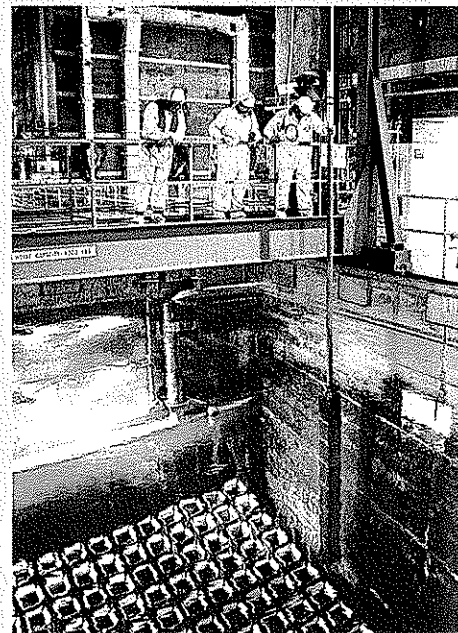
Over the long term, the development of nuclear energy requires prudent and environmentally sensitive use of global resources. That includes recycling used nuclear fuel. After one use in a reactor, about 95 percent of the

material in nuclear fuel still contains energy value. Recycling this material makes efficient use of natural resources and results in a smaller volume of used fuel byproducts requiring disposal. Ultimately, a geologic repository will be needed for these byproducts.

The nuclear industry's integrated approach to managing used fuel includes these steps:

- safe storage at reactor sites
- development of one or two interim storage facilities
- research and development of advanced technology for recycling used nuclear fuel
- development of a national repository.

When used fuel is removed from the reactor, it is placed in a steel-lined concrete pool filled with water.



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